IN THE CLAIMS:

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1.-4. (cancelled)

5. (currently amended): A method of segmenting an image formed by a plurality of pixels, each pixel being described by a vector having components each relating to a different measured image characteristic, said method comprising the steps of:

(a) receiving, for each pixel, a plurality of the vector components and a corresponding error covariance representation of that pixel;

(b) for each pixel, fitting each component and the corresponding covariance representation to a predetermined linear model to obtain a set of model parameters and corresponding confidence representations;

(c) defining the pixels each to be initial regions of the image;

(d) merging the regions in a statistical order using the sets of model parameters and confidence representations to obtain a null segmentation of the image;

(e) analysing a curve formed using the model parameters and corresponding confidence representations to determine an optimal halting criterion at which to cease the merging of the regions; and

(f) processing said merging of the initial regions to halt when the optimal halting ~~merging~~ criterion is reached.

6. (currently amended): A method according to claim 5, wherein ~~sub-step~~step (f) comprises re-executing the merging of the initial regions using said model parameters and confidence representations, and halting when said optimal haltingmerging criterion is reached.

7. (currently amended): A method according to claim 5, wherein sub stepstep(e) comprises identifying returns to monotonicity from local minima in the curve and selecting a predetermined ~~the~~ return approaching the null segmentation as the optimal halting criterion.

8. (previously presented): A method according to claim 7, wherein step (f) comprises re-executing the merging of the initial regions using the model parameters up until the predetermined return is reached.

9. (previously presented): A method according to claim 5, wherein the statistical order is determined using an order of minimum covariance-normalised vector distance between adjacent regions of the segmentation.

10. (previously presented): A method according to claim 5, wherein the statistical order is determined using a length of a common boundary between adjacent regions.

11. (currently amended): A method according to claim 5, wherein the statistical order is determined by dividing a ~~minimum~~ covariance-normalised vector

distance between adjacent regions of the segmentation by a length of a common boundary between adjacent regions, and ordering the resulting quotients.

12. (previously presented): A method according to claim 11, wherein each quotient forms a test statistic, a record of which is retained at each merging step to form said curve.

13. (previously presented): A method according to claim 5, wherein the plurality of vector components comprise at least two of color, range and motion.

14. (previously presented): A method according to claim 13, wherein the color vector component comprises at least one color channel of a color space in which the image can be reproduced.

15. (previously presented): A method for unsupervised selection of a stopping point for a region-merging segmentation process, said method comprising the steps of:

(a) analysing a graph of merging cost values to identify departures from substantial monotonicity of the graph; and

(b) selecting the stopping point to be a merging cost value corresponding to a return to monotonicity of the graph, the selected stopping point being associated with one of a limited plurality of final ones of the departures in the region merging process.

16. (currently amended): A method according to claim 15, wherein the selected stopping point ~~comprises~~ corresponding to a return associated with ~~from~~ the final departure.

17. (previously presented): A method according to claim 15, wherein the departures are larger than a predetermined threshold.

18. (currently amended): A method according to claim 15, wherein the merging cost ~~function comprises~~values comprise an ordered series of test statistics, each test statistic being formed, for each adjacent pair of regions in the segmented image, by dividing a covariance-normalised vector distance between the pair by a length of a common boundary between the pair.

19.-22. (cancelled)

23. (currently amended): Apparatus for segmenting an image formed by a plurality of pixels, each pixel being described by a vector having components each relating to a different measured image characteristic, said apparatus comprising;

means for receiving, for each pixel, a plurality of the vector components and a corresponding error covariance representation of that pixel;

means for fitting, for each pixel, each component and the corresponding covariance representation to a predetermined linear model to obtain a set of model parameters and corresponding confidence representations;

defining means for defining the pixels each to be initial regions of the image;

merging means for merging the regions in a statistical order using the sets of model parameters and confidence representations to obtain a null segmentation of the image;

curve analysing means for analysing a curve formed using the model parameters and corresponding confidence representations to determine an optimal halting criterion at which to cease the merging of the regions; and

processing means for processing the merging of the initial regions to halt when the optimal halting ~~merging~~ criterion is reached.

24. (currently amended): Apparatus according to claim 23, wherein said processing means comprises means for re-executing the merging of the initial regions using the model parameters and confidence representations, and halting when the optimal halting ~~merging~~ criterion is reached.

25. (previously presented): Apparatus according to claim 23, wherein said curve analysing means comprises means for identifying returns to monotonicity from local minima in the curve and means for selecting a predetermined the return approaching the null segmentation as the optimal halting criterion.

26. (previously presented): Apparatus according to claim 25, wherein said processing means comprises means for re-executing the merging of the initial regions using the model parameters up until the predetermined return is reached.

27. (previously presented): Apparatus according to claim 23, wherein the statistical order is determined using an order of minimum covariance-normalised vector distance between adjacent regions of the segmentation.

28. (previously presented): Apparatus according to claim 23, wherein the statistical order is determined using a length of a common boundary between adjacent regions.

29. (currently amended): Apparatus according to claim 23, wherein the statistical order is determined by dividing a ~~minimum~~ covariance-normalised vector distance between adjacent regions of the segmentation by a length of a common boundary between adjacent regions, and ordering the resulting quotients.

30. (currently amended): Apparatus according to claim 29, wherein each quotient forms a test statistic, a record of which is retained at each merging to form the curve.

31. (previously presented): Apparatus according to claim 23, wherein the plurality of vector components comprise at least two of color, range and motion.

32. (previously presented): Apparatus according to claim 31, wherein the color vector component comprises at least one color channel of a color space in which the image can be reproduced.

33. (previously presented): Apparatus for unsupervised selection of a stopping point for a region-merging segmentation process, said apparatus comprising:

means for analysing a graph of merging cost values to identify departures from substantial monotonicity of the graph; and

means for selecting the stopping point to be a merging cost value corresponding to a return to monotonicity of said graph, the selected stopping point being associated with one of a limited plurality of final ones of the departures in the region merging process.

34. (currently amended): Apparatus according to claim 33, wherein the selected stopping point ~~comprises~~ corresponds to a return ~~from~~ associated with the final departure.

35. (previously presented): Apparatus according to claim 33, wherein the departures are larger than a predetermined threshold.

36. (currently amended): Apparatus according to claim 33, wherein the merging cost ~~function comprises~~values comprise an ordered series of test statistics, each test statistic being formed, for each adjacent pair of regions in the segmented image, by dividing a covariance-normalised vector distance between the pair by a length of a common boundary between the pair.

37.-40. (cancelled)

41. (currently amended): A program for making a computer execute a procedure to segment an image formed by a plurality of pixels, each pixel being described by a vector having components each relating to a different measured image characteristic, said program comprising:

code for receiving, for each pixel, a plurality of the vector components and a corresponding error covariance representation of that pixel;

code for, for each pixel, fitting each component and the corresponding covariance representation to a predetermined linear model to obtain a set of model parameters and corresponding confidence representations;

code for defining the pixels to each be initial regions of the image;

code for merging the regions in a statistical order using the sets of model parameters and confidence representations to obtain a null segmentation of the image;

code for analysing a curve formed using the model parameters and corresponding confidence representations to determine an optimal halting criterion at which to cease the merging of the regions; and

code for processing the merging of the initial regions to halt when the optimal halting ~~merging~~ criterion is reached.

42. (previously presented): A program for making a computer execute a procedure for unsupervised selection of a stopping point for a region-merging segmentation process, said program comprising:

code for analysing a graph of merging cost values to identify departures from substantial monotonicity of the graph; and

code for selecting the stopping point to be a merging cost value corresponding to a return to monotonicity of the graph, the selected stopping point being associated with one of a limited plurality of final ones of the departures in the region merging process.

43. (currently amended): A program according to claim 42, wherein the selected stopping point ~~comprises~~ corresponding to a return ~~from~~ associated with the final departure.

44. (currently amended): A program according to claim ~~43~~42, wherein the departures are larger than a predetermined threshold.

45. (currently amended): A program according to claim 42, wherein the merging cost ~~function comprises~~values comprise an ordered series of test statistics, each test statistic being formed, for each adjacent pair of regions in the segmented image, by dividing a covariance-normalised vector distance between the pair by a length of a common boundary between the pair.